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Against the Grain

"Linking Publishers, Vendors and Librarians"

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Innovations Affecting Us — DataPlay's High Density Disc and Agilent's Optical Switch Fabric

by **Norman Desmarais** (Phillips Memorial Library, Providence College, Providence, RI) <normd@providence.edu>

The quest for increasingly high capacity storage devices seems insatiable. Yet, the computer industry continues to develop such storage devices while decreasing their size. **DataPlay Inc.** introduced the latest of these devices, called a **DataPlay disc**, on April 5 at the spring **Internet World**. The disc's creators say this new optical medium will have 500 megabytes of memory—about the same as a CD-ROM but it will be about the size of a quarter. It will be able to record and store information just like a computer floppy disk; but it will require a microoptical engine (reading device) that is expected to be incorporated into a variety of consumer electronic devices.

DataPlay's goal is to develop technology and products that will allow consumers easy access to all kinds of content whether downloaded off the Internet, prerecorded, or created by consumers. The company envisions the DataPlay disc for storing electronic books, digital images, audio, and multimedia presentations for use in e-book readers or computers, digital cameras, portable music players, and portable organizers or personal digital assistants (PDAs).

For example, a student can carry an entire semester's books on a single DataPlay disc. A family can take and store photos from an entire vacation. A music lover can carry several albums; or a gamer can carry the latest games.

DataPlay expects its products to fill the demand for easy access to electronic content, a demand driven by the proliferation of Web appliances. The company is pursuing strategic relationships with industry leaders in different market sectors who recognize the potential of DataPlay's technology to bring content and products to a wider audience. The company's chief executive is **Steve Volk**, a

businessman and scientist who previously helped develop the 2.5-inch disk drive used in notebook computers and the 1.8-inch hard drive used to store data on portable PC cards.

DataPlay discs let customers download e-books from digital book Websites or go to a local bookstore to buy pre-recorded e-books. A single DataPlay disc can hold several e-books complete with multimedia features such as sound and pictures. One can even listen to an audio book on a DataPlay disc. By recording several titles on a disc, publishers can sell a single title and give consumers an option to buy other titles by the same author or on the same subject at a later time. Upon payment, the reader can unlock the title and activate it.

DataPlay has also developed ContentKey, a tool that allows consumers to activate prerecorded content on a DataPlay disc over the Internet without requiring them to download it. A reader just clicks on a book title to transfer it to an e-book reader. If one likes the book, he or she can just read it. One could activate another one of the author's titles instantly just by going online.

Because DataPlay discs are recordable, readers can highlight text and write notes

in the margin—perfect for textbooks, cookbooks, etc. They can even create and publish their own works on them or use them to store computer data, such as word processor files, spreadsheets, database data, or computer programs much like they use floppy disks. The disc's small size makes it very portable. It can easily fit in a shirt pocket for later use with an e-book reader or PDA. Permanent recording

technology means that readers don't have to keep transferring e-books from a PC to a memory card for use in a portable reader and back again.

Hardware manufacturers in the music and digital film industries have focused on "flash" memory. Flash memory is a solid-state storage medium enclosed in small, plastic cases; but it is expensive. Sixty-four megabytes can cost \$200. A DataPlay disc is inexpensive (\$5 to \$10 a disc retail) and can help address one of the biggest industry needs for portable digital audio players: expandable and affordable memory. It also offers ways for audiophiles to enhance the storage of their Rio players while spending far less money. Record labels could sell an album on the disc and embed five additional albums. Consumers could then have the option of paying for the other albums at a later date when the embedded music would be unlocked and activated.

Larry Kenswil, president of **eLabs' Universal Music Group** is very excited about this technology because of its versatility and portability. He believes that it will enhance consumers' experience with music because it opens a world of new possibilities for the recording, storing, and carrying of content. DataPlay discs are universal in that they let consumers download, record, and play anything digital—books, photos, games, music, whatever—all on a single disc.

DataPlay's technology is compelling; but it will have to persuade makers of portable devices to make compatible hardware. The company will also have to persuade publishers, record labels, and other content creators to embrace the discs. It will also require its own reading device and have to compete with CD, CD-ROM, DVD, and online delivery formats.

DataPlay expects DataPlay discs containing prerecorded content to be available in early 2001

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along with DataPlay-enabled consumer electronic devices. Blank DataPlay discs will be available at local stores to download Internet-published content and for use in DataPlay-enabled consumer electronic devices manufactured by major companies in the digital camera, digital music, PDA, and consumer electronics industries. Any or all of these appliances will be able to use a single prerecorded or blank DataPlay disc.


Another technology to watch is **Agilent Technologies' optical switch fabric** which promises to increase network bandwidth and speed data throughput. **Agilent Technologies** is a spinoff from **Hewlett-Packard**. Its optical switch fabric, which will be available next year for building all-optical networks, can handle 32 input and 32 output optical fibers on a chip the size of a dime. It uses bubble-jet printer technology and a vapor bubble to switch light signals from one optical fiber to another without first converting the signals to electrical impulses.

The switch fabric will allow vendors to switch light directly without first converting it to electrical impulses. This will make it possible for service providers to sell high-bandwidth wavelengths to customers. Customers will then be able to put any traffic of any protocol at any bit rate onto a wavelength because the entire connection between points in the network will be optical. Conventional services, like frame relay

and ATM, require customers to package data in the proper protocol before sending it. They must also transmit it at the rate of the service they have bought.

Agilent's technology uses tiny bubbles instead of the microscopic mirrors that **Lucent** uses in its all-optical switches. The bubbles receive light from optical fibers and divert it directly to any other fibers attached to the same switch fabric. A waveguide, which is a glass channel that confines the light, guides light from an incoming fiber through the switch fabric and directs it down a defined path. The light can also pass straight through the switch without being diverted. However, the switch temperature must be 65 degrees Celsius to work properly.

The bubble-jet heaters can set up a switch path in less than 10 milliseconds which is considerably faster than the 50-millisecond limit carriers set on acceptable network failures. Customer applications running across a network will not be able to detect a failure if the network can be restored within 50 milliseconds; so the switch could be used to route traffic along an alternate path around a broken fiber.

The switch has no moving parts; so it is theoretically less susceptible to failure. However, micromirror optical switching technology is still young; and nobody knows how well it will stand up over the long term. It is also unclear how well the bubble-jet heaters will stand up when used continuously for months or years. This could be the case in certain switch configurations. 

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